adermatoglyphia

Adermatoglyphia is the absence of ridges on the skin on the pads of the fingers and toes, as well as on the palms of the hands and soles of the feet. The patterns of these ridges (called dermatoglyphs) form whorls, arches, and loops that are the basis for each person's unique fingerprints. Because no two people have the same patterns, fingerprints have long been used as a way to identify individuals. However, people with adermatoglyphia do not have these ridges, and so they cannot be identified by their fingerprints. Adermatoglyphia has been called the "immigration delay disease" because affected individuals have had difficulty entering countries that require fingerprinting for identification.

In some families, adermatoglyphia occurs without any related signs and symptoms. In others, a lack of dermatoglyphs is associated with other features, typically affecting the skin. These can include small white bumps called milia on the face, blistering of the skin in areas exposed to heat or friction, and a reduced number of sweat glands on the hands and feet. Adermatoglyphia is also a feature of several rare syndromes classified as ectodermal dysplasias, including a condition called Naegeli-Franceschetti-Jadassohn syndrome/dermatopathia pigmentosa reticularis that affects the skin, hair, sweat glands, and teeth.

Frequency

Adermatoglyphia appears to be a rare condition. Only a few affected families have been identified worldwide.

Genetic Changes

Adermatoglyphia is caused by mutations in the *SMARCAD1* gene. This gene provides information for making two versions of the SMARCAD1 protein: a full-length version that is active (expressed) in multiple tissues and a shorter version that is expressed only in the skin. Studies suggest that the full-length SMARCAD1 protein regulates the activity of a wide variety of genes involved in maintaining the stability of cells' genetic information. Little is known about the function of the skin-specific version of the SMARCAD1 protein, but it appears to play a critical role in dermatoglyph formation. Dermatoglyphs develop before birth and remain the same throughout life. The activity of this protein is likely one of several factors that determine each person's unique fingerprint pattern.

The *SMARCAD1* gene mutations that cause adermatoglyphia affect only the skin-specific version of the SMARCAD1 protein. These mutations reduce the total amount of this protein available in skin cells. Although it is unclear how these genetic changes

cause adermatoglyphia, researchers speculate that a shortage of the skin-specific version of the SMARCAD1 protein impairs signaling pathways needed for normal skin development and function, including the formation of dermatoglyphs.

Inheritance Pattern

Adermatoglyphia is inherited in an autosomal dominant pattern, which means one copy of the altered *SMARCAD1* gene in each cell is sufficient to cause the condition. In many cases, an affected person has one parent with the condition.

Other Names for This Condition

- absence of fingerprints
- ADERM
- ADG
- immigration delay disease

Diagnosis & Management

These resources address the diagnosis or management of adermatoglyphia:

- Genetic Testing Registry: Adermatoglyphia
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C1851080/

These resources from MedlinePlus offer information about the diagnosis and management of various health conditions:

- Diagnostic Tests
  https://medlineplus.gov/diagnostictests.html
- Drug Therapy
  https://medlineplus.gov/drugtherapy.html
- Surgery and Rehabilitation
  https://medlineplus.gov/surgeryandrehabilitation.html
- Genetic Counseling
  https://medlineplus.gov/geneticcounseling.html
- Palliative Care
  https://medlineplus.gov/palliativecare.html

Additional Information & Resources

MedlinePlus

- Health Topic: Skin Conditions
  https://medlineplus.gov/skinconditions.html

Genetic and Rare Diseases Information Center

- Adermatoglyphia
  https://rarediseases.info.nih.gov/diseases/12550/adermatoglyphia

Educational Resources

- Disease InfoSearch: Absence of Fingerprints Congenital Milia
  http://www.diseaseinfosearch.org/Absence+of+Fingerprints+Congenital+Milia/74
- Disease InfoSearch: Adermatoglyphia
  http://www.diseaseinfosearch.org/Adermatoglyphia/7635
- MalaCards: adermatoglyphia
  http://www.malacards.org/card/adermatoglyphia
- Orphanet: Absence of fingerprints-congenital milia syndrome
  http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=1658
- Orphanet: Isolated congenital adermatoglyphia
  http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=289465
- Science Magazine: The Mystery of the Missing Fingerprints
  http://www.sciencemag.org/news/2011/08/mystery-missing-fingerprints
- Swiss-Prot Protein Spotlight: The Ends of Our Fingers
  http://web.expasy.org/spotlight/back_issues/136/

Patient Support and Advocacy Resources

- National Foundation for Ectodermal Dysplasias
  https://www.nfed.org/
- Resource List from the University of Kansas Medical Center: Dermatology and Genetics
  http://www.kumc.edu/gec/support/derm.html

Genetic Testing Registry

- Adermatoglyphia
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C1851080/

Scientific articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28adermatoglyphia%5BTIAB%5D%29

OMIM

- ADERMATOGLYPHIA
  http://omim.org/entry/136000
- ADERMATOGLYPHIA WITH CONGENITAL FACIAL MILIA AND ACRAL BLISTERS, DIGITAL CONTRACTURES, AND NAIL ABNORMALITIES
  http://omim.org/entry/129200

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